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# ANTRYCIDE AND THE FUTURE OF TRYPANOSOMIASIS OF CATTLE

BY

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I have been asked on numerous occasions why no details have been made available of the work on antrycide, which has been my main employment for the past three years. It was understandable, after the interest aroused in this drug three years ago, that there should be some impatience for further details about its powers to protect cattle exposed to tsetse flies. We were faced, however, with problems of some complexity and I have been very anxious that no results should be made public until the work was sufficiently advanced to give ample confirmation of such opinions as might be expressed. Furthermore, the series of experiments on which I have been engaged have been financed largely from Colonial Development and Welfare funds and I have not thought it right that any results should be made public before they were submitted to the Colonial Office.

A report has now been prepared about this work, which describes in detail what has been done, and supports the conclusions reached by means of a large series of tables and charts, virtually giving in compressed form all the data which have been collected. This report is in the hands of the Tsetse and Trypanosomiasis Committee of the Colonial Office and may, I hope, be published at some future date in a condensed form. It is the function of this Committee to decide policy in regard to the use of antrycide and any remarks that I may make represent purely personal views. I can lend a copy of this report to anyone who is interested.

I cannot hope during the time available to-night to describe all that has been done in the past three years. I am intending rather to attempt a review of the present position in the light of what we have discovered and—rashly perhaps—to forecast what the future may hold as a result of the discovery of antrycide.

Davey (1950) has published the results of his work in East Africa. Results in the laboratory had shown that the soluble antrycide dimethyl-sulphate was an effective cure of early *T. congolense* infections of cattle, with perhaps slightly less activity than dimidium bromide but a much wider therapeutic index. Against early *T. vivax* infections it was effective and the activity was greater than that of dimidium bromide. For prophylactic purposes, the insoluble dichloride is used. Davey's laboratory tests showed that a single subcutaneous injection of 10 c.c. of a 20 per cent. suspension prevented infection with *T. congolense* for five months or more and with *T. vivax* for three months or more.

These results were sufficiently encouraging to justify the expense of exposing cattle, which had received various combinations of the antrycide salts, to the attack of tsetse flies in their natural habitat. Experiments were started by Davey at Nsongezi in Uganda, a *Glossina morsitans* area, and Kiboko in Kenya, which is infested with *G. pallidipes*, *G. longipennis* and *G. brevipalpis*. Davey wished to discover how long it would be before blood smears became positive after a single injection of various combinations of the salts of antrycide had been given. Results at first appeared to be promising and with suitable mixtures of the salts the laboratory results were confirmed. At this point, however, a doubt began to arise. Many of the cattle appeared to be sick, in spite of the negative blood smears, and some died. Davey (*loc. cit.*) has recorded my own belief, arrived at from clinical and *post-mortem* examinations, that some of the cattle were infected with trypanosomiasis in spite of the negative blood smears.

Those of us who have worked with trypanosomiasis in the field know only too well the type of chronic case in which it is almost impossible to find trypanosomes in the blood but which, one feels certain, is infected, a diagnosis eventually being confirmed by the discovery of perhaps a single parasite after days or weeks of searching. The cases at Kiboko had the appearance of such chronic cases and I had virtually no doubt in my own mind that many of Davey's cattle were infected long before blood smears became positive.

Subsequently, as of course was expected, all of Davey's cattle showed positive blood smears. Attempts to treat them with antrycide and dimidium were unavailing and there was a heavy mortality. Some of the cattle survived for 18 to 20 months after receiving further injections of antrycide. They were then killed for autopsy.

In October, 1949, two further groups of cattle were given antrycide and sent to Kiboko for certain experiments. All these cattle quickly contracted *T. congolense* and *T. vivax* infections and most of them died within three months. Trypanosomes were collected from them and both *T. congolense* and *T. vivax* were tested in the laboratory for drug-fastness. The *T. congolense* strains resisted the action of both antrycide and dimidium, the *T. vivax* strains antrycide only. By introducing untreated cattle into the area after the removal of all treated cattle, it was possible to collect drug-resistant trypanosomes for as long as seven months, after which this work was discontinued.

These results emphasised the serious danger of misusing trypanocidal drugs, such as antrycide, especially when employed for prophylactic purposes.

Furthermore, doubts about the nature of the protection afforded by antrycide were reinforced. Could it be that the drug prevented the appearance of parasites in the blood, but enabled some hitherto unrecognised form of the disease to develop? If so, could this form of the disease be transmitted and would the trypanosomes so transmitted be drug-fast? These were very important questions, which must affect the policy to be adopted with regard to the use of antrycide for prophylactic purposes. If through injudicious use, drug-fast trypanosomes should become widely disseminated throughout the tsetse populations of Africa, the result would be very serious. The problem, moreover, was a particularly difficult one; the suspected disease was hypothetical and there was no known means of diagnosis.

*Post-mortem* studies of the Kiboko cattle had revealed a heavy localisation of trypanosomes in the cardiac capillaries, a phenomenon not previously described and not encountered in my own studies extending over a number of years. These

* Paper given at the Kabete Veterinary Research Club on Friday, May 9th, 1952.

cattle, as already stated, had all shown positive blood smears, though parasites were not normally present in great numbers. This discovery suggested that the site of any cryptic focus of parasites might be the capillaries of the heart.

At this stage, new experiments were started in the Coast Province, near Mariakani. Permission was obtained to keep cattle at a small sacred grove called Kaya Fungo. This was an isolated area of woodland infested with *G. austeni*. It was decided to test, in the first place, the effect of giving injections of antrycide monthly and every second month, thereafter lengthening the interval if these periods were effective. No positive blood smears were detected in either group during the first 12 months. During the second 12 months, five transitory blood infections with *T. vivax* or *T. congolense* occurred in animals from either group. Subsequently, a further group of cattle which received injections every three months, was sent. This routine was found insufficiently effective and the group was discarded.

To discover whether the cattle in the first two groups were really protected or whether they suffered from a cryptic form of the disease, the following tests were made :—

*Blood Examinations.*—The haemoglobin level was tested weekly by the Tallquist method. After the third week of exposure to tsetse values began to fall from 80 to 70 per cent. and then to 60 per cent. After two years these values remain at this level though there is at present a slight tendency to rise to 70 per cent.

Oxalated blood samples were sent weekly to Kabete from six cattle, three from each group. These revealed a fall of red cell count, haemoglobin and packed cell volume. The bloods from the group receiving monthly injections were found on statistical analysis to be significantly higher in all values than those from the cattle receiving antrycide every two months.

*Autopsies.*—A special group of cattle was sent to Kaya Fungo which received antrycide every two months. These were killed at intervals and *post-mortem* examinations were made. Lesions were found similar to those of cattle suffering from trypanosomiasis, but generally milder. There was splenomegaly, hyperplasia and oedema of the lymphatic glands, hyperplasia of haemo-lymph glands, and in a proportion of cases subepicardial and subendocardial haemorrhages and lesions of the myocardium. Bone marrow was deficient in the long bones, but appeared to be normal in the sternum, ribs and vertebrae. In a proportion of cases there were signs of degeneration of the kidneys and in some cortical ischaemia.

*Tissue Smears.*—Smears from the hearts of all animals examined showed trypanosomes. They were mostly in a state of lysis but some normal parasites, chiefly *T. congolense*, were also seen. They were also found in some lungs, kidneys, haemo-lymph glands and adrenals, in that order of frequency.

*Section Material.*—Parasitological examination of sections has confirmed the results of the smear examinations. Histological examinations are now being made and should give useful information about the condition of these cattle.

*Provocation of Rinderpest Susceptible Cattle.*—Sixteen rinderpest susceptible cattle were given antrycide every two months and exposed to the tsetse flies. At intervals, four cattle received injections of attenuated rinderpest goat virus. In four cases, positive blood smears were detected shortly after the virus was administered.

*Shock Treatment.*—Seven cattle were brought to Kabete from Kaya Fungo. They received injections of 5 c.c. of T.A.B. vaccine and 6 c.c. of 1 : 1,000 adrenaline repeated twice daily on three successive days. Four of these cattle developed *T. congolense* infections.

*Sub-inoculations.*—Massive sub-inoculations of blood and tissue pulp were made into clean cattle. In no case did infection develop in the sub-inoculated cattle.

As already stated, five cattle showed transitory blood infections after the 12th month. This, in addition to the results given above, leaves little doubt that under the conditions of the experiment, the cattle did not possess a sterile immunity against trypanosomiasis. Not only were trypanosomes present in their tissues, but they [the cattle] showed physical changes indicating that, in spite of their healthy appearance, they were suffering from a chronic disease. In addition, when extra strain was placed on them by injection of attenuated rinderpest virus or shock treatment, a proportion succumbed to trypanosomiasis.

It was, however, quite impossible to transmit trypanosomiasis either by injection of blood or of pulp from the tissues. It is, therefore, unlikely that any danger existed of spreading drug-fast trypanosomes. Care was taken to remove any cattle which showed positive blood smears from contact with the tsetse flies and trypanosomes collected in untreated cattle sent to the area have not proved to be drug-fast.

Under the conditions of our experiments, then, antrycide did not give a sterile prophylaxis, but under conditions of careful control its use does not appear to be dangerous. Furthermore, 12 cattle were removed from Kaya Fungo to Kabete, after which injections of antrycide were discontinued. Blood examination indicated that on arrival they were cryptically infected with trypanosomiasis. None of these cattle ever showed positive blood smears and the blood picture gradually returned to normal, indicating that any masked infection was overcome naturally in the course of time. It cannot be doubted, however, that the use of antrycide as a prophylactic over wide areas and for unlimited periods of time would involve risks too great to be accepted. Nevertheless, let us not decry the remarkable properties of this drug, which can for the first time enable cattle to survive and—as I shall show shortly—breed in tsetse fly country. Let us also give full credit to the discoverers, Curd and Davey (1950) and to Messrs. Imperial Chemical (Pharmaceuticals), Ltd., for their courage and vision in stripping their biological laboratories of scientists and technicians, who could ill be spared, so that they could test this drug in Africa. There are many important uses for the drug, even though its application may be more limited than was hoped at first. It is my sincere hope that its remarkable properties will be recognised and used to the full.

The discovery of van Hoof, Henrard and Peel (1944), van Hoof, Lewillon, Henrard, Peel and Rodjestwensky (1945)—since amply confirmed—that a single injection of pentamidine at 12-month intervals can protect human beings from *T. gambiense* infections, naturally gave rise to the hope that a similar drug might be found which would do the same for cattle. I myself have little faith in such hopes. Pentamidine cannot protect laboratory animals against *T. gambiense* and, although highly trypanocidal for *T. congolense*, I have failed (unpublished data) to protect cattle with it. Man has a strong natural resistance to *T. gambiense* infection. Often he cannot be infected and often infections prove transitory or remain latent for long periods. The effectiveness of pentamidine in man I regard as being due to this strong natural resistance, a resistance which cattle do not possess against *T. congolense* or *T. vivax*. In support of this, I may quote Fulton (1944), who considered that the protection demonstrated by van Hoof *et al.* (*loc. cit.*) was due to immunisation produced by frequent injections of trypanosomes and not (after the first two to four weeks) to the action of the drug. I believe that Fulton goes too far, but that the prophylactic action of drugs is due to a combination of the drug's effect and natural and acquired

resistance factors. I have not the time now to go into the evidence for this, apart from what appears in this paper.

I have always believed that some other solution must be found to the problem of raising cattle in tsetse areas. There are obvious difficulties in maintaining injections of large numbers of cattle in wild country for indefinite periods, should the raising of stock be attempted on a large scale. We should, therefore, consider whether alternative possibilities exist.

What, then, can be done? It is well known that in many parts of Africa where infestation is light, native-owned stock resist the tsetse fly, where freshly introduced cattle will die. In such cases, the young calves are exposed to the bite of tsetse flies from birth. It is known that young calves have a markedly higher resistance to the disease than adult cattle, as they have in the case of redwater and anaplasmosis. Such was noted by early travellers, Livingstone (1857), Baines (1877), Bradshaw (1881), Selous (1893); it has been studied by Schilling (1933, 1935), van Saceghem (1936, 1938), Fiennes, Jones and Laws (1946). It has seemed to me for a long time that if cattle could be enabled to dwell in contact with tsetse flies sufficiently long to rear their calves, the new generation might be able to survive without the use of drugs.

An opportunity occurred to test this in our experiments at Mariakani. For this purpose, the first groups of cattle sent there were in-calf cows. Normal healthy calves were born and the cows returned to the bull; in due course a second batch of calves was born.

In the first batch of calves, the heifers received prophylactic treatment at birth and at six weeks, as we wished to ensure their survival as future breeding stock. The bull calves received no treatment until seriously infected. All the calves became infected in due course. They were treated solely on clinical grounds if they appeared to be very sick; the treatment given was antrycide sulphate, which has not got the prophylactic properties of the chloride. After 12 months all treatments were discontinued. Apart from some deaths from East Coast fever and accident, the calves have grown and developed well and weight increase has been at least normal. It is interesting to note that the condition of the bull calves, in general, has been better than that of the heifers, showing that the initial prophylactic injections interfered with the development of immunity. At 18 months, the calves show scanty trypanosomes in blood smears, but in other respects appear healthy and in good condition although no treatment has been given for six months.

The second batch of calves are now some six months old. A few of the older ones received a single treatment with antrycide sulphate, but all treatments have now been discontinued and the younger calves have never been treated at all. Two calves have never become infected in the six-month period; the others have become infected but are not noticeably sick; they appear to be in good condition, and are maintaining their growth rate well. Numbers of trypanosomes in blood smears appear to be on the decrease.

The first batch of calves received an average of four curative treatments during the first 12 months of their lives. Without this, they would almost certainly have died. The development of immunity in the dams, in spite of the absence of trypanosomes from the blood, and its transmission passively in colostrum and milk is suggested by the greater ability of the second batch of calves to resist trypanosomiasis or its effects, although drug treatments have been withheld.

At the present stage, these experiments cannot be regarded as conclusive, but my own view that the crux of the trypanosomiasis problem is to enable the dams to survive for sufficiently long to rear calves has been greatly reinforced. If this should be so, there is no doubt that antrycide has supplied the key to this problem.

The problem of trypanosomiasis of cattle appears to be not unlike that of malaria of human beings. In this disease, there is a heavy mortality of susceptible adults entering a malarious area, if treatment is not given. In the case of populations resident in malarious areas, however, the disease is contracted during infancy; there is a certain percentage of infant mortality; children who survive are affected more or less constantly during the first seven years of life, when there is a splenomegaly; after this stage, the spleen becomes normal in size and an increasing resistance develops until in adult life the disease causes little trouble and efficiency is not affected by it. Resistant adults, who go to fresh malarious areas, are susceptible, however, to new strains of the parasite.

The difficulty with regard to cattle, I believe, has been that in heavily infested tsetse areas the mortality is 100 per cent. The raising of young stock to adult life, when an effective resistance will be developed, must be dependent on two factors: firstly, attack by tsetse flies from birth onwards; secondly, the receipt of passive immune bodies in colostrum and milk. It has not hitherto been possible to create these conditions. By the use of antrycide, however, these conditions can be created and, as our experiments are showing, under them the young stock can survive and maintain their growth rate, as do children brought up in contact with malaria. I confidently expect these young calves to grow into useful resistant adults. In the course of time, natural selection should eliminate the less resistant strains of cattle and I have no doubt that it will be possible to raise useful productive stock in contact with heavy infestations of tsetse flies.

Whether this view will prove to be correct remains to be seen. If not, I do not think that an answer exists to the problem of raising stock in tsetse areas, unless the dangers of continued administration of prophylactic drugs are accepted. I except, of course, the possibility that naturally resistant stock, such as the West Coast Ndama, will be found suitable for general introduction.

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### Weekly Wisdom

*He had worked with scientists for more than 50 years, and there was no more pathetic sight than a badly educated specialist. We must take care not to turn these out in undue numbers.*—Lord Waverley (Lords' debate on scientific research, June 11th, 1952).

# LABORATORY ASSESSMENT OF TICK-KILLING AGENTS

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## INTRODUCTION

Several attempts have been made, by means of laboratory tests, to assess the value of various dip fluids for the control of ticks. Omer-Cooper and Whitnall (1945), working with *Boophilus decoloratus* (the blue tick) in South Africa, and Laws (1948) describe techniques upon which they place some reliance. Whitnall *et al.* (1949) quote methods in reporting the occurrence of a tick resistant to BHC in the East London district, and Gohan and Weir (1950) report a method used with *Musca domestica*.

Heath, in an abstract of the article by Arnold (1949), commented that the behaviour of engorging female *Ixodes ricinus* on the host was different from its behaviour *in vitro* when treated with various dip fluids [*vide Vet. Bull.* **20.** 448, abst. 1999).

The present experiments, part of a series conducted during the investigation of tick control agents in Jamaica, are reported in the hope that they may help to define the value and limitations of such laboratory tests. All the work here recorded was carried out with *Boophilus annulatus* (var. *microplus*), the "Texas fever tick."

The value of a satisfactory laboratory test which could be employed for the assessment of tickicides will be appreciated by all who have attempted to evaluate dips or have investigated complaints of their efficacy in the field. In the case of the newly introduced "synthetic" dips the problem is made more complicated by the following factors which, together or separately, may affect the tick killing powers of the dip fluid. These factors, from their nature, may not show up for some time after the dip has been giving satisfactory control and has been pronounced efficient :—

1. *The Concentration of the Insecticide.*—This is easily measured in the case of arsenic for which a suitable bath-side test is available, but is more difficult with BHC, toxaphene, chlordane and DDT (in some cases necessitating shipment of a sample to Britain). In the case of BHC chemical estimation of the active gamma isomer can only be done in certain specialised laboratories and its estimation is not a practicable procedure for a general routine test. A figure for "total BHC" (a mixture of all isomers) is more easily obtainable but in view of the indications that selective decomposition of the gamma isomer of BHC occurs under certain circumstances, this is a serious drawback, and under field conditions renders the chemical test of little value.

In the case of BHC-DDT mixtures it is impossible to assess the strength of each component, results being given as "total mixed insecticides."

In some of the cases quoted later in this paper a figure is given for "biological efficiency." These refer to tests which were carried out for the writer by the Cooper Technical Bureau. The test is a biological one, using a grain weevil as test insect, and it gives a measure of the insecticidal efficiency of the dip fluid. Thus, for example, a sample containing 0·1 per cent. BHC (total isomers) may behave in the biological test as if it contained only 0·05 per cent. BHC, the loss of 50 per cent. activity presumably being due to the destruction or inactivation of part of the gamma isomer.

2. *Factors Interfering with the Action of the Insecticide.*—Influences included under the heading are mud, dung, urine, hair, etc., which find their way into the tank. It is known that as dipping washes get progressively dirtier they do not retain their full efficiency ; they will not prove so effective as freshly made washes of the same chemical strength. Suspicion naturally turns to the fouling materials referred to. Their action may be physical, perhaps an adsorption of the active insecticide and therefore a physical interference with it, or possibly they may act indirectly by providing suitable conditions for the growth of micro-organisms which cause the chemical breakdown of the active insecticide.

Other possible influences to be considered under this head are the emulsifying or suspending agents or wetting or "sticking" agents employed.

3. *The Intrinsic Susceptibility of the Tick to the Insecticide Used.*—This, with special relation to BHC dips, is the subject of this report.

During 1948–50 BHC paste dips came to be widely used in Jamaica. These dips gave excellent control of ticks and throughout most of the year it was found possible to allow dipping intervals of up to eight weeks (complete eradication of ticks is not attempted). During 1949 many farmers reported that they were unable to use these long dipping intervals without building up a heavy infestation of ticks and during 1949–50 many complaints were received that BHC dips were failing to control ticks in spite of weekly dippings at full strength.

## THE *in vitro* TEST

The *in vitro* test was applied in a number of such cases. By means of the test it was possible to demonstrate that on certain farms tick populations had acquired some degree of resistance to the insecticide.

The method of testing is based on that previously described by the author (1949), modified following suggestions from Whitnall (1949).

The present technique is as follows :—

Ticks are collected by hand from the animals. Some care is needed to avoid injury to the mouth parts, but since *Boophilus* does not bury deeply into the skin it can usually be removed intact without difficulty. Only fully engorged females should be used for the test.

In the laboratory they are divided into a number of equal groups—one each for the various concentrations of dip fluid under test, plus a control batch. The ticks are placed in a small-mesh wire basket and immersed in a beaker of dip fluid for about 30 seconds, being gently agitated. It was found in previous trials that the exact period of immersion is not of great importance.

A small quantity of cotton wool has meanwhile been soaked in the same strength dip fluid. Excess is squeezed out (into the sink) and the wool placed as a pad in an open petri dish. The ticks are placed on this and allowed to remain for one hour in the open air. They are then removed and placed in batches of two or three in tubes loosely stoppered with cotton wool.

The tubes are stacked together in a dark cupboard in which is kept a basin of water to maintain humidity, and kept at room temperature, observations being made from time to time. The final readings can usually be made at approximately six weeks after the test was set up.

Notes are made of the number of ticks laying eggs, and of the estimated percentage hatch of each batch. The figures for percentage control are arrived at by multiplying the percentage of ticks ovipositing by the percentage of ova hatching, dividing by 100 and subtracting the result from 100.

Interference with the results from fungus growth on the ticks sometimes follows. This usually occurs only on moribund ticks, but ticks showing fungus growth must be omitted from the calculations.

TABLE

RESULTS OF *in vitro* TESTS

| BHC (total all isomers) strength in test fluid | Farm and date of test | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 25.3.50 A | 28.3.50 B | 30.3.50 C | 10.10.50 C | 18.5.50 D | 23.5.50 E | 29.5.50 F | 27.6.50 G | 10.10.50 H | 1.11.50 I | 9.11.50 J | 8.12.50 K |
| 0% Tap water ... | 19 | 5 | 5 | 0 | 33 | 30 | 64 | 5 | 3 | 20 | 5 | 7 |
| 0·125% BHC ... | 19 | 94 | 64 | 80 | 100 | 98 | 100 | 100 | 6 | 100 | 90 | 27 |
| 0·25% BHC ... | 36 | 100 | 64 | 85 | 100 | 100 | 100 | 100 | 15 | 99 | 100 | 17 |
| 0·5% BHC ... | 36 | 100 | 92 | 100 | 100 | 100 | 100 | 100 | 8 | 100 | 100 | 60 |
| 1·0% BHC ... | 36 | 100 | 100 | 98 | 100 | 100 | 100 | 100 | 19 | 100 | 100 | 73 |
| 2·0% BHC ... | 60 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 32 | 100 | 100 | 77 |

Figures give " percentage control " (see text) of engorged female *Boophilus* dipped in various strengths benzene hexachloride suspension.

## OBSERVATIONS

The results of *in vitro* tests are given in the table.

The case reports of a number of these complaints are given in concise form below :—

### FARM A

This is a large beef-raising property, well managed but heavily stocked. BHC paste dips had been in use from 1947 to 3.1.50 when difficulty of control was first reported. The tank was small (2,000 gallons capacity) and there was no foot bath. Several visits were made and dip samples taken. A sample taken 16.3.50 was tested in Britain by the makers ; although the theoretical concentration was 0·125 per cent.* BHC (total isomers) the sample gave a chemical test equivalent to 0·157 per cent. BHC (total isomers) while the biological efficiency (using the grain weevil test) was equivalent to 0·037 per cent. total BHC. This indicated selective inactivation or decomposition of the gamma isomer in the dip tank. In the meanwhile dipping and spraying trials were carried out on the farm.

Spraying tests with known concentrations of BHC paste dips showed that strengths of 0·25 per cent. BHC (total isomers) were not killing young engorging females, nymphs or moulting forms.

A sample of ticks, removed for an *in vitro* test as described, showed a marked resistance to BHC.

### FARM B

This farm was situated in the plains and for the previous 12 months had been used for field trials in connection with a newly introduced BHC emulsion dip. This latter had given good control until the trials were discontinued ; later the tank was refilled with an arsenical dip and good control again obtained. There was nothing to suggest that the ticks were not fully susceptible to BHC and this view was supported by the *in vitro* results.

### FARM C

BHC paste dips had been used for some time and it had been found necessary over the course of 18 months to decrease the dipping interval from approximately 30 to 10 days. At this dipping interval, and using BHC at 0·167 per cent. strength, adequate control was obtained. Spraying intervals, using BHC at 0·5 per cent. strength, killed all stages of tick except moulting nymphs and some engorged females, but at 0·1 per cent. strength did not kill moulting nymphs, or engorging females.

*In vitro* tests carried out on two occasions indicated little, if any, resistance to BHC.

### FARM D

This is a large beef-raising property on the plains. It is very well managed and tick control had been excellent over the previous two and a half years when a chlordane emulsion dip was used at a strength of 0·2 per cent. chlordane, with dipping intervals of six weeks. Since September, 1949, a BHC paste dip was used and it was soon found necessary to reduce the dipping intervals to two weeks, in spite of the fact that the concentration of BHC was later increased from 0·10 to 0·20 per cent. total BHC.

The dipping tank was small (2,000 gallons) and the approach pens very muddy ; there was no foot bath.

A visit was paid in May, 1950, and it was felt that there was no evidence of intrinsic resistance by the tick since dipping at two-weekly intervals in a freshly filled tank gave good kills. It was suggested that the trouble arose from deterioration or mechanical inactivation of the dip wash, the latter being more probable. Spraying trials with BHC suspensions later in the year (September, 1950) confirmed this view and *in vitro* tests showed no evidence of resistance. Unfortunately, no biological efficiency test was carried out.

### FARM E

This was a badly run dairy farm on the plains using arsenical dips with irregular dipping intervals. Small-scale spraying and fogging with various BHC dips had, from time to time, been carried out but there had been no consistent use of such dips and no cause to suspect any BHC resistance.

*In vitro* tests showed a high degree of susceptibility to BHC.

### FARM F

A property with both beef and dairy herds on " red dirt " (bauxite) soil. The tank was large (4,500 gallons) and the herd relatively small. When BHC paste dips had first been used it was found that dipping intervals of four to six weeks gave satisfactory tick control but after about a year it had been found necessary to decrease the interval to about three weeks.

* Throughout this paper concentrations of BHC are given in terms of technical material containing approximately 13 per cent. gamma BHC.

XUM

The herd was inspected in May, 1950, and the conclusion arrived at that kills were adequate when dipped in freshly topped-up dip. It was believed that "stripping" had been excessive and that the bath was understrength but no suggestion of resistance was made.

A chemical test, however, showed a total BHC content of 0·119 per cent. but a biological efficiency equivalent to only 0·011 per cent. An *in vitro* test showed no evidence of resistance of the tick to BHC.

### Farm G

This was a mixed farm on the plains with both beef and dairy herds. The dip tank was 2,000 gallons capacity. A BHC paste dip had given good results over a period of about a year but later a complaint was received that dipping intervals had to be shortened considerably. There was no evidence of BHC resistance and spraying with 0·125 per cent. BHC gave good tick control in the dairy herd.

### Farm H

A large commercial dairy on the plains, with a large tank (4,000 gallons) but no foot bath. In wet weather pastures, approaches and the tank become very muddy and foul.

This farm had used BHC dips for a little over a year before trouble was reported. It was then complained that the dipping interval had to be decreased to one week but, in spite of this and frequent topping-up of the bath, the control of ticks became less satisfactory. This was at first believed to be due to stripping or loss of biological efficiency in the tank, and advice was given to empty and refill the tank. Kills in the newly filled tank were only slightly better. Meanwhile a sample of the original dip fluid had been analysed and found to contain 0·133 per cent. total BHC and biological efficiency equivalent to 0·075 per cent.

Spraying tests were then carried out and showed that all stages of the tick were unaffected by spraying with 0·10 per cent. BHC. Spraying with 0·5 per cent. BHC showed that ticks were susceptible in all stages except the moulting nymphs. The degree of resistance would therefore be between the two concentrations.

Ticks taken for an *in vitro* test showed a marked resistance to BHC. This confirms the results of the spraying trial and suggests that both a BHC resistance and deterioration in the tank were involved in this instance.

### Farm I

A dairy farm on heavy land, tank small and approach pens muddy.

A BHC paste dip had been in use for about one year but the level of control had recently declined. The dip fluid was very dirty and spraying tests gave good kills. It was decided that the main cause of trouble was deterioration in the tank, and the reversion to arsenical dip was recommended. *In vitro* tests showed no evidence of BHC resistance.

### Farm J

This herd has never used BHC for tick control. There was no *in vitro* evidence of BHC resistance.

### Farm K

A dairy herd on low, heavy soil, dip tank small, and approach pens dirty. BHC paste dips had been used for some 18 months; good control was obtained at first but lately kills had been poor despite frequent topping-up and short dipping intervals.

The dip was emptied and refilled at 0·10 per cent. BHC but control still was not adequate. Spraying trials using BHC paste dip at 0·10 per cent. and 0·20 per cent. BHC were therefore carried out and showed all stages except larvae to be unaffected by 0·1 per cent. BHC and all stages except engorging females and moulting nymphs susceptible to 0·2 per cent. BHC.

It was recommended that the approach pens be cleaned, a foot bath be installed and the sediment trap attached to the tank be blocked (as quite a lot of the BHC powder had apparently been lost in this trap). These recommendations undertaken, the tank was recharged with 0·20 per cent. BHC and control obtained for a few weeks. Examination of animals dipped twice weekly for three weeks showed that all stages of ticks were unaffected by dipping. A chemical test of a sample from the tank proved the dipwash to be chemically up to strength (0·204 per cent. BHC) while the biological efficiency was equivalent to 0·14 per cent. BHC.

The *in vitro* test confirms the suggestion that there is resistance.

## Discussion

The case histories sketched above illustrate the various causes of failure of BHC encountered and support the results obtained from the *in vitro* test. While no great exactitude can be claimed for the test and no conclusion can be based on small differences, it is felt that the *in vitro* tests do reflect in a broad way the *in vivo* picture. It is not possible to relate the results too closely to what actually happens on the host animal since BHC causes rapid dropping off of the engorged female *Boophilus* and behaviour of these ticks is variable. The value of such tests appears comparable with that of spraying tests on the host animal, and although it is longer before results are obtained, it is often more convenient to have a laboratory rather than a field test available since the field test necessitates re-examination of the animals for several days after spraying.

The investigation of the factors involved in the failure of synthetic insecticides as tick control agents has become unexpectedly complicated by the factors mentioned above. It is probable that other factors will appear as the problem is investigated more fully.

It is interesting to speculate on the mechanism of development of resistance to BHC. Four possibilities suggest themselves :—

(*a*) By mutation.

(*b*) That resistant strains of tick are present to some extent in most tick populations and that such strains breed resistant offspring which in time become the dominant strains on the farm.

(*c*) Selection has occurred through modification of the life history of the tick which favours its survival with certain dips. An example might be the lengthening of the period spent in the nymph-adult moult. During this period ticks are resistant to all but the highest concentrations of most insecticides including BHC; but most young adults are killed as they emerge from the moulting skin by insecticides which persist in the coat. If the length of moulting period exceeds the period of persistence of the insecticide, adults emerging escape its action and survive to breed.

(*d*) The loss of biological efficiency resulting from microbiological breakdown of the active isomer of BHC results in the ticks being exposed to decreasing concentrations of the active isomer, although chemical tests show apparently full strength. It may be that the ticks gradually become tolerant to larger concentrations of the insecticide. This possibility is not acceptable to fashionable genetical thinking.

Where resistance has been established it seems that practical control of ticks will come most rapidly and successfully from the introduction of new insecticides, rather than by the use of the original dips in greater concentration or in modified form. The diversity of insecticides now available is thus very fortunate. Any new insecticide used should be used at full strength so that a complete kill of all ticks is made at one time. Where deterioration may occur in the tank, as may happen with most synthetic dips, the advantage of spraying over dipping is apparent.


### Summary

An *in vitro* test for susceptibility of *B. annulatus* to BHC is described and the appearance of resistant strains of this tick in various parts of Jamaica is recorded.

The value of the *in vitro* test is discussed in relation to its value in the field investigation of dipping problems.


*Acknowledgments.*—I wish to record my appreciation of the assistance rendered by Messrs. Cooper McDougall & Robertson, Ltd., in particular by Mr. H. E. Harbour, B.A., M.R.C.V.S., who visited Jamaica to investigate this and other problems, and by Mr. W. Ryle-Davies, of Messrs. T. Geddes Grant, Ltd., who were responsible for many of the observations and for much advice.

The analyses and tests for biological efficiency were carried out by the Cooper Technical Bureau.

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## A TECHNIQUE FOR BOVINE BLOOD TRANSFUSION*


BY

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In the course of an experiment several pints of blood had to be withdrawn repeatedly from bulls and transfused into cows. Three main difficulties were encountered: (1) the donor bulls were fractious so that venipuncture and blood withdrawal had to be accomplished as rapidly as possible; (2) the constant movement of the animal tended to dislodge the needle and cause clotting in the bore; (3) the normal venous blood pressure was not sufficiently high to give a flow rapid enough to withdraw several pints quickly and to prevent gradual blocking of the needle by blood clotting.

To overcome these difficulties the following technique was adopted. Standard human one-pint transfusion bottles were used containing 120 c.c. of a sodium citrate anticoagulant. The bottle caps were left loose during sterilisation and were screwed tight immediately after removal from the autoclave; consequently, a partial vacuum developed in the bottle and was used effectively to produce a rapid flow of blood. The needles used were Record-fitting, 3 inches long by 2 mm. bore. Clotting in the needles was prevented by treating them with silicone (G.E.C. Dri-Film 9987). The needles were thoroughly cleaned and dried. Silicone was drawn through them a few times followed by a quick rinse in cold water. Residual traces of HCl (the solvent for the silicone) were removed by a quick wash in weak ammonia solution and finally the needles were thoroughly washed in water and dried. They were sterilised by a few minutes' boiling. This single coating of silicone was effective for several transfusions in the course of a month.

A needle was fitted to one end of a 6-foot length of rubber pressure tubing and a Record-fitting adaptor, also treated with silicone, inserted into the other. The donor bull was tied to a stall division and its neck extended. A thin cord passed round the base of its neck was tightened until the jugular vein was easily palpable and a needle was then thrust directly into the vein.

When the blood was flowing freely the needle was attached to the adaptor in the end of the pressure tubing. The needle at the other end was then pushed through the stopper of the partially evacuated transfusion bottle and a fast flow of blood resulted. When the bottle was full the distal needle was withdrawn and inserted into a second and subsequent bottles. The method presented no difficulties and a large quantity of blood could be rapidly withdrawn. The same apparatus, with the addition of an air inlet fitted to the bottle, was used to inject the blood into the recipient cow. The jugular and milk veins were used with equal ease and satisfaction.

The use of silicone-treated glassware has also certain advantages in veterinary practice.

If Record syringes are treated with silicone, clotting time is markedly prolonged and use may be made of this where it is desired to inoculate a calf with the blood of its dam. Whole blood collected in a large silicone-treated syringe can be injected directly, without the use of anticoagulants.


### Summary

(1) A simple method is described for withdrawal of blood from the bull. The main feature is the ease and speed with which blood can be collected from fractious animals. This is accomplished by the use of large needles, pre-treated with silicone, and by using partially evacuated transfusion bottles.

(2) A simple method is described for inoculating calves with the blood of their dam.


My thanks are due to Professor D. F. Cappell for suggesting this application for silicone, and for a supply of the material.

* This work was carried out while in receipt of a full-time A.R.C. Grant.

## REFORM OF THE *LOI GRAMMONT*

"Efforts are being made in France," states the Society for the Protection of Animals in North Africa, "to reform the century-old *Loi Grammont*, the only French law for the punishment of cruelty to animals, and which nullifies the work of animal protection societies by imposing fines of 5 to 15 francs, now only equivalent to a few pence! Up to five days' imprisonment can theoretically be imposed for repeated offences, but in practice is never resorted to. The law is still further weakened by the fact that cruelty must take place in public, and an ownerless animal is not protected at all.

"A petition is being presented, and the 300,000 signatories include famous authors such as Cocteau and Rachilde, Church dignitaries such as the Bishop of Nancy, the Grand Rabbi, and the head of the reformed church; 100 workers of the Renault factory, the staffs of Onu and the Opéra, many members of the magistracy, aviators, painters, actors and journalists.

"The Tunis S.P.A. is busily collecting signatures, and we can only hope that all this work and very real enthusiasm will bring about the reform which is so long overdue.

"The *Loi Grammont* operates throughout French North Africa."

## CLINICAL COMMUNICATION

# A NOTE ON INTUSSUSCEPTION IN A KENYA POULTRY FLOCK

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Approximately a thousand head of poultry are presented annually for *post-mortem* examination at the Veterinary Research Laboratory, Kabete, Kenya. The numbers of intussusceptions seen in the years 1949, 1950 and 1951 were nil, nil and one respectively. In the first months of 1952 five cases of intussusception were diagnosed in one flock.

*History.*—The flock management was not good and the birds were overcrowded in permanent grass runs. The incidence of intestinal parasites was kept low only by the frequent and regular administration of anthelmintics. Only two pens were affected by intussusception. The birds were White Leghorns, two to five months old and were all related. The first case occurred in January and the remainder in the space of 10 days in April.

Post-mortem *Findings.*—Apart from the obvious lesion of the intussusception the most constant finding was the marked decomposition of the carcases. Decomposition had occurred rapidly, since there was no delay between the time of death and the *post-mortem* examination. In one case the intussuscepted bowel had prolapsed and the end was necrotic.

The helminth burden was negligible in all but one case where numerous ascarid worms were found lying free in the abdominal cavity.

### Discussion

A survey of the available literature from 1933 onwards has revealed a marked paucity on the subject of intussusception in poultry. The majority of workers (Coles, 1943 ; Morrill, 1944 ; Durant & McDougle, 1948) state that it is a rare complaint. In fact, Morrill (1944), recording the pathological findings in one case, wrote that " while probably of no particular pathologic concern, this case, in view of its infrequency, is reported for the sake of records and common interest. No similar instance has been observed at the poultry disease laboratory during the past 17 years." The *post-mortem* results at the Veterinary Research Laboratory, Kabete (Fitzpatrick, 1951, 1952 ; Scott, 1951) also emphasise the rarity of the condition so that the occurrence of five cases in one flock is of more than unusual interest.

Similarly, most workers (Morrill, 1944 ; Durant & McDougle, 1948) are agreed that the exact cause of intussusception in fowls is unknown but it is thought the immediate precursor is probably some irritation of the digestive tract at the point where the intussusception begins. Kaupp (1933) stated that among the causes are excessive and irregular peristalsis. Blount (1943) noted that the condition had occurred in a parrot with roundworms. The same author also found that in cases of psittacosis of pigeons enteritis was common and occasionally was followed by an intussusception.

No satisfactory explanation was found for the series of intussusceptions described in this note. No sudden change of management of the two affected pens was detected, and the same rations were fed to the rest of the young stock of 120 birds without untoward results. Helminths were not present in sufficient numbers in every case to be implicated. The frequent administration of anthelmintics was suggested as a possible cause but investigation failed to show any real evidence to support this conjecture. The only fresh factor was the onset of the " long rains " and with it the rapid growth of vegetation, but a careful examination did not reveal any known poisonous plants in either pen.

### Summary

The occurrence of five cases of intussusception in one flock of poultry is recorded. The aetiology was undetermined.

*Acknowledgments.*—I should like to thank Mr. P. W. Thorold, Veterinary Research Officer, Kenya, for his help in the identification of the vegetation. This paper is published with the permission of the Director of Veterinary Services, Kenya.

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## REVIEW

**[Reproduction of Animals by Artificial Insemination** [Trans. title]. By Antonio M. Filho and J. Ferriera Barreto. (1949.) Brazilian Government publication. No price stated.]

That this book covers a very wide field indeed is well exemplified by the fact of its beginning with five pages on asexual reproduction in protozoa, and on cell division processes ! The first fifth of the book gives a good general account of reproductive anatomy and physiology, and then comes a chapter on infectious disease which attempts, perhaps, to cover too much ground. The section on trichomoniasis contains some startling statements. The preparation of vasectomised teasers is considered, and an excellent chapter on the collection of semen follows, the rabbit and fowl receiving much notice in addition to the larger species. The authors have much experience with dummy cows and ewes and favour their use. Semen technology is dealt with rather briefly, the addition of antibiotics to diluter solutions receiving a bare mention in five lines.

Many insemination techniques are described. The authors balance the arguments as between intra-cervical and intra-uterine insemination of the cow, without expressing any individual preference. The techniques applicable to the ewe are described in considerable detail. Pregnancy diagnosis by Cuboni's test *in the cow* receives as much space—six lines—as does the process by rectal palpation, which might well have been discussed more fully. A good account is given of the equine pregnancy tests.

The concluding chapters deal with the organisation of centres, of which there were nine in Brazil in 1949, the legislation there applicable and a résumé of results already achieved. The book as a whole is eminently readable and would well repay translation into English. Upon the whole it is effectively illustrated, though most of the photographs of animals are from very poor quality negatives. The bibliography, though not fully comprehensive, reveals at least an adequate knowledge of the relevant literature.

## ANNOTATION

# BACTERIAL AND VIRUS INFECTIONS TRANSMISSIBLE FROM THE CAT TO MAN

Compared with the dog, the cat has received little attention from the public health point of view, though it is established quite definitely that cats are able to transmit disease to human beings. Greer and Keefer (1951) listed 16 diseases that have been or may have been transmitted by cats to man. Those known to have been transmitted were tularaemia, rabies, rat-bite fever, feline pneumonia (virus), diphtheria, tuberculosis, brucellosis, typhus, pasteurellosis, cat-scratch fever, ringworm (*Microsporum felinum* and *Trichophyton circinata*), creeping eruption (*Ancylostoma braziliensé*) and favus (*Achorion schoenleini*). Those suspected to have been transmitted were leptospirosis, plague and histoplasmosis. Greer and Keefer also recorded 20 human diseases found in cats. Apart from most of the diseases mentioned above, this list comprises amoebiasis, salmonellosis, trypanosomiasis (*Trypanosoma cruzi*), leishmaniasis, infection with dog tapeworm (*Dipylidum caninum*), fish tapeworm (*D. latum*) and liver fluke (*Paragonimus westermani*), opisthorchiasis, schistosomiasis (*S. japonicum*), strongyloidiasis and scrub typhus.

Some information is available regarding the incidence in cats of the bacterial and virus diseases that are transmissible to man. Stimpson (see Hull, 1947) in America, reported that of 588 animals diagnosed as positive for rabies, 34 were cats. Hull (1947), also in America, found the subjects of 18 of 416 cases of rabies submitted for laboratory examination to be cats. Dobson (1930) observed bovine tuberculosis in 11 of 505 cats examined in Edinburgh, and Lovell and White (1940) found four of 110 cats examined *post-mortem* to be suffering from this disease. Recently, too, cases of *Salmonella* infection in man have been traced to cats, and a survey has shown that a comparatively high percentage of healthy cats (1·4%) excrete salmonellae in their faeces (Cruickshank & Williams Smith, 1949). The organisms isolated belonged to types commonly incriminated in outbreaks of food-poisoning, one of them being the causal agent of paratyphoid fever.

Of considerable interest at the moment are diseases that may be transmitted to man through the aggressive activities of cats. *Pasteurella septica*, and occasionally *Spirillum minus*, infection in man following the bite of a cat harbouring either of these organisms in its mouth or respiratory tract is well recognised as a distinct clinical entity. This disease has now been replaced in importance by cat-scratch fever (*la maladie des griffes de chat*). The latter was reported first in France by Debré and his colleagues (Debré *et al.*, 1950), although it appears that its existence in that country and in the U.S.A. has been known for a number of years. It is relatively common in France and is considered to be ubiquitous in the U.S.A. (*Lancet*, 1952 ; Foshay, 1952). Cases have also been reported from Switzerland and India. Curiously enough, an annotation upon the subject in the British medical Press (*Lancet*, 1952) appears to have stimulated interest in the search for the disease in this country and four cases have already been reported (Campbell & Wheaton, 1952 ; Cox, 1952 ; Garai, 1952 ; Wigley, 1952) with the distinct prospect of more to follow.

The symptoms of the disease show some variation, but, typically, it commences as a painless swelling of the regional lymphatic glands a few days after the patient is scratched by a cat. The lymphadenitis may then extend to other glands of the group and is usually accompanied by fever and general illness. Occasionally, some of the glands may break down and suppurate. Pustular eruptions of the skin also may occur. Recovery is usually spontaneous though it is hastened by aureomycin therapy (Traissac & Marot, 1951 ; Usteri & Hedinger, 1951).

Bacteriological examinations have thrown no light on the cause of this disease. Attempts to discover the causal agent by inoculation of infected material into hen's eggs and laboratory animals, including cats and birds, have yielded consistently negative results (Mollaret *et al.*, 1950) although it was possible to reproduce the infection in one of four human beings and three of four monkeys (Mollaret *et al.*, 1951b). Complement fixation tests have shown some cross-reaction with viruses of the lymphogranuloma group (Mollaret *et al.*, 1951a), although the results were inconclusive. The general concensus of opinion is that the causal agent is a virus of the lymphogranuloma-psittacosis group although this, of course, awaits positive proof. Diagnosis is based on the clinical picture and on the characteristic histology of material from an affected gland (Mollaret *et al.*, 1950, 1951a, b). Reliance is also placed on an intradermal test using antigen prepared from infected glandular material (Debré *et al.*, 1950).

All the British and American cases have followed cat-scratches but some of the French ones have followed other methods of skin puncture (Mollaret *et al.*, 1950 ; Siguier *et al.*, 1951). It may be, then, that the cat is not a reservoir of the infecting agent but merely bears it on its body. This view is supported by the fact that all the incriminated cats were healthy and that it was not possible to infect cats experimentally. Further evidence must be awaited, however, before any definite conclusions can be drawn. The intradermal testing of cats and other animals might yield some information on this matter. Veterinary surgeons are probably exposed to more risks of being scratched by cats than any other section of the population and it may be that some will recall clinical symptoms similar to those described above following a cat-scratch. It would be interesting, too, to know how those working in small-animal practices would compare with country practitioners, and with the general population, if they were tested intradermally with cat-scratch fever antigen.

H. Williams Smith.

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## ABSTRACTS

### Pathological Anatomy of the Intervertebral Disc*

In this thesis, which is based on a study of 38 cases (35 dogs, three cats), the author deals particularly with the occurrence and pathogenesis of the osteophytes on the ventrolateral aspects of the vertebral column, especially seen in the posterior dorsal and lumbar regions, that are found quite commonly, and with increasing frequency in advancing age, in the dog, but only rarely in the cat. These osteophytes are always accompanied by lesions of the intervertebral discs, and the author shows how the formation of these bony growths can be considered to be a result of these lesions. When degenerative changes occur in the nucleus pulposus, resulting in loss of its elasticity, the nucleus may fail to return to its normal position following ventral displacement, as it should do during the normal movements of flexion and extension of the vertebral column. The intervertebral distance becomes smaller, and the nucleus may become more or less permanently displaced or herniated ventrally. The annular fibres of the ventral part of the disc bulge downwards, and in this way lead to deformity of the inferior common ligament passing beneath. The tension thus put upon this ligament leads to osteogenesis at the site of the attachments on the vertebral bodies at either side of the disc concerned, and the osteophytes are formed with their bases a little distance from the articular surface of the vertebral body. As a result of these and associated changes, there may be signs of pain or stiffness, and some degree of ankylosis; also there may be some interference with the movements necessary for defaecation and, particularly if the sternal and chondrocostal joints are involved, with respiratory movements.

E. C.

* **Contribution to the Pathological Anatomy of the Intervertebral Disc.** (Trans. title.) Debard, H. [Thesis for Doctorate in Veterinary Medicine.]

* * * * *

### Sulkowitch Test in Traumatic Gastritis*

This article draws attention to the possibilities of the use of the Sulkowitch test as an "on-the-spot" aid in the diagnosis of traumatic gastritis in cattle. The author, from his use and experience of the test in the field, suggests that there may be a definite relationship between a negative reaction to the test and a traumatic gastritis. He reports one clinical case in detail, with urine from the sick cow showing a negative reaction, and specimens from eight other healthy cows collected at the same time showing positive reactions. Rumenotomy confirmed the diagnosis and the author further records that in 75 per cent. of the cases where surgery or slaughter verified the suspected presence of metallic foreign bodies, the urine calcium via the Sulkowitch test was negative. No serum calcium levels were taken in any of these cases. The question of a transient drop in serum calcium (and hence urine calcium) in a traumatic condition is raised and several other features pertinent to this question are mentioned.

[*Abstractor's Note.*—The Sulkowitch test is a simple test used for rapidly estimating the amount of calcium in the urine.

Its suggested use† in the diagnosis and therapy of bovine hypocalcaemia is based on the rough correlation between the level of serum calcium and the amount of calcium excreted in the urine. The reagent, an oxalate buffer mixture, is stable and keeps well. The technique, which consists of mixing equal quantities of urine and reagent, is given in full and the reactions, which vary from negative associated with a hypocalcaemic serum level to positive (very heavy) indicating danger of hypercalcaemia, are tabulated. Data obtained from clinical and experimental use of the test are presented and interpretations suggested, though the authors stress that further use of the test under clinical conditions is required for its full evaluation.

†The Sulkowitch Test as a Guide in the Diagnosis and Therapy of Bovine Hypocalcaemia. D. K. Detweiler, v.m.d., m.s., and J. E. Martin, v.m.d. *Amer. J. vet. Res.* **10.** (July, 1949.) 201.—J. C. H.]

* **The Sulkowitch Test in Traumatic Gastritis.** Silver, J. (1951.) *N. Amer. Vet.* **32.** 829-830.

* * * * *

Mr. Angus Foggie, of the Moredun Institute, writes:—

"In the abstract of my paper on the infectious agent of tick-borne fever in sheep in your issue of July 5th, the following phrase appears: '. . . and affected rams are temporarily sterile.'

"While not questioning the accuracy of this statement, I would like to point out that no reference is made to male fertility in the original article."

## ROYAL COLLEGE OF VETERINARY SURGEONS

### Membership Examinations, June-July, 1952

List of Successful Candidates

(*Continued from page* 419)

**London** (*continued*)

First Examination

*Both subjects*

Butler, B. C.
Cocks, Edwin (C)
Davison, R. S. (C)
Ford, J. G. B.
Girling, Miss M. J. (C)
Hughes, J. R.
*Jones, C. R. V.
Jones, W. A.
Kinnear, C. S.
Mullen, P. A. (C)
Nettleton, L. B.
Noordin, B. K. M. (C)
Oakley, G. A. (C)
Osman, B. D. (C)

*One subject*

Barnett, K. C. (C)
Blackmore, D. K. (C)
Bousfield, W. E. D.
Byrne, G. A.
Clark-Lewis, A. V. (C)
Cook, W. E. R. (C)
Cullinane, J. A. (C)
Ealden, G. E. (C)
Giles, H. G. (C)
Holland, Wm. (C)
Howse, J. N.
Imhof, M. N.
Kirkpatrick, J. C.
Lawrence, B. T. (C)
McKie, Miss E. M. C. E. (C)
May, J. N. T.
Nelson, E. P. (C)
Oke, M. A. (C)
Owen, D. P.
Robbins, G. R. (C)
Stocks, B. M.
Swayne, T. C. B. (C)
Tanner, J. A.
Wood, George

* Denotes Second-class Honours.
(C) Denotes Credit in Chemistry.

**Liverpool**

Third Examination

*Pathology only*

Kiernan, N. S.

Final Examination

Awad, F. I.
Wright, G. W.

**Edinburgh**

First Examination

Brown, Miss D. D.
Brunton, A. S.
Coutts, K.
Cribb, P. H.
Easingwood, D. E. (C)
Gee, B. D.
Griffiths, P. H. M.
Harkness, Michael
Hartley, E. G.
Hastie, Hamish
*Jones, J. H.
Kettles, A. S.
†Lawrence, J. A.
Leitch, I. D. C. M. (C)

Macdonald, D. C.
McFerran, J. B.
McHugh, T. M.
Pratt, D. A. (C)
Rodger, J. L.
Rowland, James (C)
Sedgwick, J. R. W.
Smith, P. J.
Stephens, M. B.
Todd, R. H. (C)
Tordoff, D. B.
Walker, W. D.
Wastie, Miss P. C.
Watt, R. D. (C)

† Denotes First-class Honours.
* Denotes Second-class Honours.
(C) Denotes Credit in Chemistry.

SECOND EXAMINATION

Ashton, P. K. (P)
Baird, J. S.
Barnes, Miss P. C. (P)
Barr, T. R. B.
Borthwick, Ramsay (P)
Cathcart, R. A. (P)
Christie, R. F. (P)
*Couttie, Peter
Cuthbertson, J. L. H.
Dickson, James
*Edwards, Miss M. E.
Findlay, C. R.
Garden, Sigurd
Gripper, J. N. (P)
*Haith, C. F.
Hovell, G. J. R.
Howells, G. J.
Humphreys, M.
*Ingham, Brian
Irving, Miss P. M. (H)
Jones, D. F. (H)
*Levack, Miss M. E. S.
Maasri, K. J.
Manktelow, D. B. S. (H)
Muirhead, R. H.
Murphy, O. M. G. (P)
*Parminter, Donald
Paterson, R. C. G.
*Pill, A. H.
*Podd, G. H.
*Poole, Anthony
Prior, J. G.
Raditapole, N. N.
Shires, R. M.
Spence, J. B.
*Sutherland, I. H.
Taylor, J. C.
Tennant, L. D. (P)
Watt, I. M. (P)
*Weaver, A. D.
Williams, G. L. (P)
*Wittrick, D. A.

* Denotes Second-class Honours.
(P) Denotes Credit in Physiology.
(H) Denotes Credit in Histology.

THIRD EXAMINATION

Archibald, D. R. N.
Barlow, R. M. (A)
Billinge, P. R. H. (A)
Chong, S. N.
Clarke, Miss C. E.
Curran, G. D.
Davidson, H. J. (A)
Ferguson, A. R.
*Fraser, D. G.
Fraser, J. A.
Gould, C. M.
Grant, Forbes
Green, W. C.
Griffiths, T. G. G.
Hands, R. R. (A)
Hayes, Hilton
Hunt, D. T.
McAllister, Joseph
MacKay, A. F.
Mitcheson, J. A. J.
Nelson, A. M. R.
Reid, G. S. (A)
Scoggins, Miss J. M. T. (A) (H)
Sharratt, R. K.
Shields, W. G.
Spencer, G. A.
Stevenson, R. B.
Stewart, A. F.
Taylor, A. R.
Thorne, J. P.
Veale, J. C.
Walker, A. I. T. (A)
Watson, Michael
Wetherill, G. D.
*Windsor, Miss M. D.
Wright, Daniel (A)

* Denotes Second-class Honours.
(A) Denotes Credit in Anatomy.
(H) Denotes Credit in Histology.

FOURTH EXAMINATION

Adamson, J. D.
Affleck, Harry
Barker, A. M.
Barnes, Joseph
Bowie, J. T.
Browne, V. A. D.
Cartwright, C. F.
Couttie, M. A.
*Dovey, J. S.
Drake, T. J.
Eddy, Cecil
*Fuller, A. T.
Garrett, T. R.
Gourlay, R. N.
Hamilton, W. W.
*Harrington, J. L.
Harrison, A. F.
Inness, J. F.
Jacob, M. B.
*Le Cheminant, D. A.
Lyon, Miss E. C. M.
Mackie, W. L. (Paras)
McCormick, A. N.
MacLeod, Peter (Paras)
Nelson, J. P.
Norman, T. H.
O'Reilly, K. J. (Path)
Patel, M. R.
Proverbs, R. S.
Roberts, A. W.
Ross, I. I.
Scales, Philip
Sellers, R. F. (Path)
Smith, V. W.
Stewart, D. L. (Path)
Storrar, J. E.
Vasey, H. P.
Wells, Miss A. J. (Path)
Wilson, P. G. R.

* Denotes Second-class Honours.
(Path) Denotes Credit in Pathology.
(Paras) Denotes Credit in Parasitology.

FINAL EXAMINATION

Boycott, B. R.
Brown, R. D.
Dawson R. T.
Duberley, W. R.
Duguid, I. M.
Edgar, J. T.
Fisher, E. W. (M)
Fleming, Miss H. E.
Forrest, W. T.
Fraser, J. S.
Greig, Norman
Harris, A. H.
Hiscock, R. H.
Hockenhull, E. W. F.
Hutchinson, H. L.
*Kidd, J. N.
Leslie, P. G.
McFerran, W. H.
Mackenzie, C. P.
MacLennan, D. J. (S)
Mallalieu, J. M.
Merry, S. J.
Mitchell, Douglas
Moore, Duncan
Munro, John
Ormiston, T. T.
Palmer, R. H. F. (S)
Pette, F. D.
Phillips, A. P.
Philp, G. I.
Robertson, A. G.
Sutherland, Miss A. M.
Thomson, A. P.
Tremlett, J. G.
Turnbull, A. S. (S)
Turnbull, J. M.
Tweedale, O. L.
Watt, D. J.
Whitelaw, Alexander

* Denotes Second-class Honours.
(M) Denotes Credit in Medicine.
(S) Denotes Credit in Surgery.

**Glasgow**

THIRD EXAMINATION

Towers, Miss I. G.
Watson, J. D.
Watson, J. M.
West, R. C. A.

FOURTH EXAMINATION

Borland, H. A.
Coats, W. A.
Cocozza, G.
Cruickshank, G.
Cullen, Robt. (Path)
Ferguson, Angus (Path)
*Gibb, J. A.
Johnston, W. S.
Lyon, Miss B. E.
McCusker, H. B.
Mackenzie, Alexander
McNair, R. C.
Morris, David
Orr, Miss M.
Prydie, John
Seawright, David (Path)
Slater, Duthie
Smith, J. H.
Spy, G. M.
Taylor, J. L.
Tudhope, K. M.

* Denotes Second-class Honours.
(Path) Denotes Credit in Pathology.

FINAL EXAMINATION

*Agnew, J. H.
Anderson, A. W.
Anderson, C. C.
Baker, Norman
Bent, C. L.
Bunyan, F. S. R.
Cameron, Miss M. C.
Deboni, Miss R. I. Y.
Emmett, F. McL.
Gilchrist, Miss M.
Howat, A. N. H.
Howat, W. P.
Hutchison, Michael
Hyatt, Miss J. M.
King, J. G.
Kyle, David
Lyons, A. R.
Macleod, A. J.
Macpherson, Robert
Mann, Miss E. M.
Mundell, David
Murdoch, M. I.
Nicolson, T. B.
Parkyn, D. R.
Renton, Miss J. P.
Sanderson, John
Schwartz, Cecil
Skulski, George
Tattersall, D. J.
Thompson, J. D.
Weipers, Mrs. Mary (M)

* Denotes Second-class Honours.
(M) Denotes Credit in Medicine.

*(To be concluded)*

The National Equine Defence League have issued a manifesto calling upon the Government to take immediate action to arrest the decline in the working horse population of this country, which has dropped from 1,000,000 in 1939 to 430,000 to-day. It is stated in the manifesto: "We imported 12,609 horses from Eire in 1951 but they will have been slaughtered for human consumption."

## QUESTIONS IN PARLIAMENT

### Foot-and-Mouth Disease

Mr. DEEDES (July 10th) asked the Minister of Agriculture if he is aware of the concern of cattle breeders in areas in which foot-and-mouth disease restrictions have led to suspension of the artificial insemination service; and whether, in view of the long-term consequences of this suspension on meat and milk production, he will review the ban on artificial insemination within the 15-mile area.

Sir T. DUGDALE: I am well aware of and much regret the difficulties caused by the interruption of the artificial insemination service as a result of outbreaks of foot-and-mouth disease. The restrictions imposed are kept continuously under review in each infected area and the service is resumed as soon as it is considered safe to do so. I am sure it would not be in the best interests of milk or meat production to resume it prematurely.

Mr. DEEDES asked the Minister of Agriculture what general instructions and guidance have been sent out in the shape of posters or leaflets to farmers and the general public on the subject of foot-and-mouth disease since the outbreak of the current epidemic in November.

Sir T. DUGDALE: Leaflets and posters containing advice about the symptoms of foot-and-mouth disease and the precautions to be taken have been distributed by my veterinary staff in all infected areas, and leaflets are supplied to anyone on request. I am sending my hon. Friend copies of the leaflets and posters, and will arrange for copies to be placed in the Library. In addition, a number of notices containing advice to farmers and the general public have been issued to the Press and broadcast by the B.B.C. I am considering what future arrangements for publicity can usefully be made.

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### Cruelty to Animals (Children)

Lieut.-Colonel LOCKWOOD (July 10th) asked the Secretary of State for the Home Department whether he is aware of the injuries caused to cattle exposed for sale in cattle markets by children and young persons; and whether he will take steps to prohibit children and young persons from frequenting that part of the market where cattle are exposed for sale, unless they are accompanied by a parent or other responsible adult person.

Sir D. MAXWELL FYFE: Apart from the two cases referred to by the hon. Member for Northfield (Mr. Chapman) during the debate on the adjournment on June 18th, I have no information about this matter. Legislation would be required to prohibit the admission of unaccompanied children to any part of a public market, and on the information before me I do not think that such legislation would be justified. The existing law is, I think, adequate to deal with children found guilty of cruelty to animals in cattle markets.

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*The Poisons Rules.*—The proposed amendments to the Poisons List and Rules indicate that a change is to be made in the Rules affecting the containers used in the packing of veterinary medicines made up ready for the internal treatment of animals. It is intended to permit the use of non-fluted containers for preparations of this character; thus veterinary injection solutions will not require a fluted bottle when the proposed amendment takes effect. Commenting on this, *The Pharmaceutical Journal* observes: "The application of this amendment to all animal medicines for internal treatment, some of which are extremely potent by human standards, does seem, however, to give rise to questions concerning the safety of those who use them, but no doubt this point will be kept in mind in framing the terms of the proposed amendment."

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A complaint from a zoologist that since the beaches at Worthing had been sprayed with DDT from a helicopter to destroy sand flies many types of fish which he used to send to the London Zoo had disappeared was read at a recent meeting of the local Fisheries Committee of Sussex Sea Fisheries District. The writer stated that lug worms, formerly taken by bait diggers in large quantities on the foreshore, had also practically disappeared. The Committee decided to send the letter to Worthing Corporation.—*The Times.*

## NOTES AND NEWS

### Diary of Events

July 25th.—Summer Meeting of the Mid-West Division, B.V.A., at Wells (Small Hall, Market Place), 2.30 p.m.

July 25th.—Meeting of the Association of Veterinary Teachers and Research Workers (Southern Region) at the Wellcome Research Station, Frant, nr. Tunbridge Wells, 12 noon.

July 30th.—Annual General Meeting of the West of Scotland Division, B.V.A., at Glasgow (North British Station Hotel), 2.30 p.m.

July 30th.—Summer Meeting of the Lancashire Division, B.V.A., at Crewe and Nantwich, 2 p.m. (See Notice.)

**Sept. 8th—13th.—Seventieth Annual General Meeting and Congress of the British Veterinary Association, at Harrogate.**

COUNCIL AND COMMITTEE MEETINGS OF THE B.V.A.

**The next quarterly meetings will be held in London on July 21st, 22nd and 23rd, in the following order:—**

**July 21st.—Monday, 12 noon, Parliamentary and Public Relations Committee; 2.30 p.m., Organising Committee.**

**July 22nd.—Tuesday, 10 a.m., Veterinary State Medicine Committee; 12 noon, Home Appointments Committee; 2 p.m., General Purposes and Finance Committee.**

**July 23rd.—Wednesday, 11 a.m., Council Meeting.**

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### PERSONAL

A MESSAGE FROM QUEENSLAND

Professor John Francis, M.SC., M.R.C.V.S., who in November last was appointed to the Chair of Preventive Medicine in the Veterinary Faculty of the University of Queensland, writes: "The Australian Veterinary Association meeting was held in Brisbane recently and was a great success. Professor Ewer has done much to establish the school and it appears that the profession in Australia and the farming community wish us every success. Dr. Sprent has just arrived from Canada and is beginning to develop work in parasitology. We are fortunate in being on the same site as the Queensland State Animal Health Laboratory and the C.S.I.R.O. parasitological laboratory under Dr. Roberts. So with our own staff and the others there is a most congenial company and we meet once a fortnight with the final year students, when papers of general interest are given. In addition, Professor Canny and his staff at the Pathology School are very friendly. Dr. Mackerras, who is head of the Queensland Medical Research Institute, worked with Gilruth, Bull and other veterinarians. He has a great admiration for their work and again is very helpful."

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*Marriages.*—HUNT—HARVELL.—On June 28th, 1952, at St. Thomas' Church, Lymington, Hants, Duncan Kenneth Hunt, M.R.C.V.S., to Mollie Hilda Emma Harvell.

SHENMAN—MOUNT.—On June 30th, 1952, at Welshpool, George Shenman, B.V.SC. (SYDNEY), N. S. Wales, to Edna Doreen Mount, M.R.C.V.S., Dayhouse Farm, near Barnsley.

* * * * *

### Foot-and-Mouth Disease in France

A SERIOUS SITUATION

Reporting that France is at present in the throes of a particularly severe outbreak of foot-and-mouth disease, the Paris Correspondent of *The Times*, in a message to his paper dated July 13th, says: "M. Antier, the Minister of Agriculture, replying last week to anxieties and criticisms voiced by many deputies and senators stated that one-fifteenth of all livestock in France was infected. The outbreak began early in May in the centre of the country, and has now spread to almost every part; it is particularly severe in Normandy, Anjou, Flanders and in the Limousin. *Le Monde* reported recently that in the Pas de Calais 750 communes out of 760 were affected.

"M. Antier declared that the Government had taken all the preventive measures required by the situation. In reply to suggestions that the disease might have been brought in by infected animals imported from Belgium and Germany, he said all meat imports from those countries had been suspended. Imports of serum from Switzerland, Germany and Holland had been increased, but they could not cover requirements. French production of serum had risen from 3,000 litres to 12,000 and Army veterinary staffs had been called upon to assist. Loans would be given to farmers who had

suffered heavy loss and in some cases they would be exonerated from taxation.

"The scarcity of serum appears to be one of the Government's great difficulties. M. Antier explained that the serum prepared before the outbreak of foot-and-mouth disease this spring had been ineffective; a new virus had made its appearance which required a different formula. This virus, according to some reports, seems to be particularly damaging to cattle. It produces complications hitherto regarded as exceptional, which are almost always fatal. Veterinary surgeons put the proportion of deaths from the new virus at 15 per cent.

"The Chairman of the Agricultural Committee in the Upper House drew attention last week to the economic consequences of the outbreak. It led, among other things, he said, to a sharp fall in milk production—by as much as half in some herds—and the raising of milk prices would therefore have to be contemplated.

"The complete ban on all markets and cattle sales in the regions affected caused economic stagnation and many farmers are short of ready money. In some parts of France, such as the centre, where oxen are still frequently used to till the land, the position of farmers with only one or two animals is extremely serious; they may be unable to bring in this year's harvest, which is particularly fine. There seems to be no doubt that apart from the peasants' traditional suspicion of the Government, the lack of success of M. Pinay's loan in country districts is due in large measure to the strain which the outbreak of foot-and-mouth disease has placed on their resources."

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### Control Restrictions Removed from Eleven Counties

Controlled area restrictions imposed on June 1st have been removed from the counties of Cheshire, Derbyshire, Huntingdonshire, Leicestershire, Northamptonshire, Nottinghamshire, Rutland, Shropshire, Staffordshire, Warwickshire and Worcestershire.

The restrictions will continue in Bedfordshire, Berkshire, Buckinghamshire, Dorset, Gloucestershire, Hertfordshire, Kent, London, Middlesex, Oxfordshire, Isle of Wight, Hampshire, Wiltshire, Somerset, Surrey, East Sussex and West Sussex, which will form one controlled area.

Compensation paid to farmers whose livestock has been slaughtered in the 520 outbreaks since November 14th is nearly £2,225,000—the largest sum ever paid in any one year. The previous highest payment was £2,208,706 in 1,929 outbreaks in 1923. The value of animals then, however, was considerably lower. Some 69,000 cattle, 26,000 sheep and 33,000 pigs were destroyed.

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## THE NATIONAL VETERINARY BENEVOLENT AND MUTUAL DEFENCE SOCIETY

The profession holds in warm regard those members who give honorary and arduous service to its benevolent agencies. Hence it will be with a deep sense of gratitude for his long period as Secretary of the National Veterinary Benevolent and Mutual Defence Society that our readers will learn that Major F. Hopkin, O.B.E., M.R.C.V.S., has handed over the duties to his successor, Mr. George Rodney Sumner, M.R.C.V.S., of 58, High Street, Woolton, Liverpool. For the time being, however, Major Hopkin will continue as Hon. Treasurer, which office he has held for a period of 32 years.

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## ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax:

*Beds.*—Town Farm, Oakley, Bedford (July 9th).

*Berks.*—Pig Farm, Arborfield Court, Arborfield, Nr. Reading (July 8th).

*Cornwall.*—Crossways, Talland, Looe (July 9th).

*Derbyshire.*—Hall Farm, Stanton-by-Dale, Nottingham (July 7th).

*Devon.*—Oare Mead Farm, Brendon, Lynton (July 11th).

*Dorset.*—Manor Farm, Charlton, near Shaftesbury (July 12th).

*Dumbartonshire.*—Whitelees Farm, Castlecary (July 5th).

*Essex.*—Cressing Lodge, Cressing, Braintree; Gatehouse Farm, Middleton (July 7th).

*Lanarks.*—Dalpatrick Farm, Rosebank, Carluke (July 10th).

*Norfolk.*—Manor Farm, Harpley, King's Lynn (July 7th); Park Farm, Griston, Thetford (July 10th).

*Northants.*—New Meadow, Wollaston, Wellingborough (July 11th).

*Oxfordshire.*—Vitamealo Research Farm, Old Manor Farm, Bix, Henley-on-Thames (July 5th).

*Salop.*—Red House, Hordley, Ellesmere (July 5th).

*Somersetshire.*—Timwood Farm, Roadwater, Old Cleeve, Watcher; Downs Farm, Walton, Street (July 5th).

*Surrey.*—Piggery, Buckinghill Farm, Ockley Road, Beare Green, Dorking (July 7th); High Pitfold Farm, Hindhead (July 8th).

Foot-and-Mouth Disease:

*Cumberland.*—Grey Moor Hill, Kingstown, Carlisle (July 7th); Denton Farm, Gilsland, Carlisle (July 9th); Denton Mains, Low Row, Brampton (July 10th).

*Dumfriesshire.*—Meinside Farm, Eaglesfield, Lockerbie (July 5th); Roberthill, Lockerbie (July 6th); The Hanns, Lockerbie; Bridge End Farm, East Riggs, by Annan (July 7th); Brandyburn, and Glenfoot Farm, Auldgirth, Dumfries; Tomshielburn Farm, Canonbie; South Corrielaw, Lockerbie (July 10th).

*Kent.*—Goat Lees Farm, Kennington, Ashford (July 4th); Vitters Oak Farm, Bethersden, and Blackwall Farm, Hinxhill, Ashford (July 5th); Goodcheap Farm, Hinxhill, Ashford (July 6th); Bartlett Farm, Great Chart, Ashford (July 8th); Bliberry Farm, Bethersden (July 11th); Runsell Farm, Bethersden, Ashford (July 13th).

*Oxfordshire.*—Gatehampton Farm, Goring (July 5th).

Fowl Pest:

*Essex.*—Willow Lodge, Kiln Road, Thundersley (July 7th).

*Northants.*—1, Jones Lane, and 8, Wyke Road, Eastrae, Whittlesey, Peterborough (July 8th).

*Surrey.*—Home Farm, Horsley Towers, East Horsley (July 11th).

*Warwicks.*—The Dell, Peterbrook Road, Warstock, Birmingham (July 10th).

Swine Fever:

*Beds.*—Eastfield Farm, Wilden (July 8th).

*Lancs.*—Hilltop House Farm, Rainford (July 7th).

*Lincs (Kesteven).*—East Heckington, Boston (July 7th).

*Staffs.*—Oak View, Wolverhampton Road, Codsall (July 10th).

*Warwicks.*—Hill Farm, Ufton, Rugby (July 9th).

*Yorks (W.R.).*—Mill Pond Field, Wakefield Road, Featherstone (July 9th); High Lea Farm, Brightholmlea, Oughtbridge (July 11th).

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## RISKS IN SHARING OF HORSEBOXES

### Transport Tribunal's Statement

The Transport Tribunal, in a statement issued recently, gave the reasons for its decision to dismiss an appeal against the granting by the Western Area Traffic Licensing Authority of a B licence for a horsebox to enable Hinton Parva Racing Stables, Ltd., near Swindon, to carry horses in training to and from race meetings and gallops.

The appellants were the Railway Executive, the Lambourn Racehorse Transport Service, Ltd., and Major W. H. Borwick, Ltd., of East Hendred, Berkshire.

The report, which is signed by Mr. N. L. Macaskie, Q.C., the Acting President of the Court, and Mr. G. H. Redman, states: "In our opinion the risk of interference with racehorses and of infection when they are being carried in hired transport, particularly when it is shared with the horses of other trainers, is sensibly greater than when they are being carried in the trainer's own horsebox in charge of his own servants.

"There are also other advantages, such as the avoidance of delays inherent in sharing a hired horsebox with another trainer's horse and being able to give effect to last-minute decisions to send a horse to a race meeting if the trainer owns and is authorised to use his own box for that purpose."

These advantages were not necessarily sufficient in themselves to justify the grant of a licence to a trainer if suitable alternative facilities were proved to be available. In this case the Court was not satisfied that the Lambourn company's transport facilities, "good though they are," were always available for the requirements of the respondents when needed.

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## ROYAL COLLEGE OF VETERINARY SURGEONS

### Accessions to the Library for the Quarter Ending May, 1952

Bradley, O. C. The structure of the fowl. *Third edition.* Edinburgh: Oliver & Boyd, 1950.

Brambell, F. W. Rogers, *and others.* Antibodies and embryos (substance of three special lectures at the Royal Veterinary College in October, 1950). London: University of London, Athlone Press, 1951.

Dobberstein, J. Richtlinien für die Sektion der Haustiere. *Siebente Auflage.* Berlin: Schoetz, 1950.

Honeker, A. Die Krankheiten der Ziege. Heft 1, Krankheiten der Verdauungsapparates von August Honeker. Dortmund: Wellerhaus, 1950.

Marshall, F. H. A. Marshall's physiology of reproduction edited by A. S. Parkes, two vols *Third edition.* London: Longmans, Green & Co., 1952.

Mason, I. L. The classification of West African livestock. Slough: Commonwealth Agriculture Bureaux, 1951. *Commonwealth Bureau of Animal Breeding and Genetics, Technical Communication, No. 7.*

Maynard, L. A. Animal nutrition. *Third edition.* New York: McGraw-Hill Book Co. Inc., 1951.

Neimeier, K. Rontgenologische Beobachtungen am Magen-Darmkanal des Schweines. Inaugural Dissertation Hannover, 1939. 1940. Presented by the Library of the Tierarztlichen Hochschule, Hannover.

Nelson, A. Medical botany. Edinburgh: E. & S. Livingstone, Ltd., 1951.

Organisation for European Economic Co-operation. The control of livestock diseases in European countries. Technical Assistance Mission No. 63. Paris: O.E.E.C., 1952.

Parker, G. H. Animal colour changes and their neurohumours. A survey of investigation 1910-1943. Cambridge: University Press, 1948. Presented through British National Book Centre.

Peyser, A. Pars pro toto. Breviarum medicum internationale. Stockholm: Almquist & Wiksell, 1950.

Society for Experimental Biology. Physiological mechanism in animal behaviour. Cambridge: University Press, 1950.

Winter, A. R., and Funk, E. M. Poultry science and practice. *Third edition.* Chicago: J. B. Lippincott, 1951.

XIVth International Veterinary Congress. 1949 Report, three vols. London: H.M.S.O., 1952. Presented by the Chief Veterinary Officer, Animal Health Division, Ministry of Agriculture.

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## PRIVATE SLAUGHTERING

During a discussion on slaughterhouse tolls at the Wrexham Health Committee, Alderman C. O. Jones (who presided) said he did not think there was any possibility of private slaughtering being allowed again. The Corporation had sought permission to increase abattoir tolls. The Ministry declined this proposal and suggested the tolls should continue on the present basis and the Ministry's deficit contribution.—*Meat Trades Journal.*

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## TENTH INTERNATIONAL CONGRESS OF DERMATOLOGY

### A Veterinary Exhibit

The headquarters and centre of the above Congress, which will run from July 21st to 26th, are to be in Bedford College, Regent's Park. The lectures and film shows are to be held there, and there will also be a museum, open from July 21st to 25th. In addition, clinical demonstrations, etc., are to be held in certain of the London hospitals. The feature of the Congress is to be the consideration of three subjects—skin tuberculosis, eczema and the use of ACTH in the treatment of skin diseases.

Mr. B. V. Jones, M.R.C.V.S., of the Department of Pathology, Royal Veterinary College, has undertaken the work of providing the veterinary exhibit. This has been designed to demonstrate certain features of the structure of the integument of the domestic animals with special reference to comparative histology. The cutaneous affections of the several species of mammals and birds have been classified according to the nature of the aetiological agents concerned and the rôle of allergy in veterinary dermatology is indicated. The more well-defined clinical pictures are illustrated by preserved specimens. The histopathology of certain lesions is demonstrated, particularly where an analogous condition is found in man or where the condition is communicable to man. Particular importance is given to the animal dermatomycoses: the lesions are described and illustrated by photographs, in order to assist the medical dermatologist in the recognition of the conditions in those animals which are in close contact with man. Attention is directed to some of the problems of diagnosis and treatment confronting both the practising veterinary surgeon and the research dermatologist.

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# CORRESPONDENCE

*The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.*

## TREATMENT OF AN INFLAMMATORY CONDITION OF THE FOOT IN PIGS

Sir,—Following the communication of A. H. Hogg (1952) concerning foot-rot in pigs, I would like to record a recent observation on the treatment of a severe inflammatory condition in the foot of a Large White boar. The outside cleat of the right hind foot showed a painful swelling of the sole, extending up to the fetlock and accompanied by an exudate of blood-tinged fluid from the coronet. At first a single subcutaneous injection of 50 c.c. sulphamezathine solution (33⅓ per cent.) was given, resulting in a temporary improvement lasting only three days. An identical result followed a second single injection 10 days later. Five days after the last treatment it was decided to prolong the effect of the agent by administering the same dose on each of four consecutive days. This procedure appeared to produce a permanent resolution of the inflammation. As this is only an individual case it would be of interest to have others' observations on the treatment of this condition.—Yours faithfully, I. B. Munro, University of Nottingham, School of Agriculture, Sutton Bonington, Loughborough. *July 12th*, 1952.

*Reference.*—Hogg, A. H. (1952.) *Vet. Rec.* **64**, 39.

## UTERINE IRRIGATION BY SYPHON

Sir,—For a number of years I have been using a Sparklets syphon for uterine irrigation with iodine solution.

A length of rubber tubing is fitted to the syphon and a milking tube fitted to the distal end of the rubber tubing. Fill the syphon with iodine solution up to the red mark, insert the glass tube and screw on the top. Screw on the $CO_2$ bulb until the gas can be heard hissing into the solution. Remove the bulb. Pressure on the lever will evacuate the entire contents and, as the syphon contains a quart, about six cows can be irrigated with each syphon. Milking tubes are easy to sterilise. A milking tube can readily be inserted into the cervical canal, even if the cow is not in season or oestrus. There is no danger of rupture of the uterus and the solution cannot be contaminated, nor is it exposed to bacteria in the cowshed. With experience the uterus can be irrigated without looking at the syphon, which is placed in the left-hand pocket of an overall. As the pressure decreases with each irrigation, the writer has a method of counting which ensures that the correct amount enters the uterus. The beginner should place the syphon on the cow's back and release the lever when the required amount enters the uterus.—Yours faithfully, J. McIlwaine, Nantypobtu, Maesllyn, Llandyssul, Cards.

## THAT SLANG TERM—"VET."

Sir,—I think that it is pretty safe to assume that, for as long as the profession continues to exist, its members will be referred to under the above term. Personally I have got used to being so christened, and provided a qualifying adjective does not precede it, do not get "hot under the collar."

When defective vision in one eye stopped me from entering the Army House at my school, a decision had to be taken as to my future career—the Church or our profession! In selecting the latter I knew how I should be referred to, realising the absurdity of expecting all and sundry to give me my full title, which very few even now seem able to spell correctly, let alone pronounce.—Yours faithfully, J. F. D. Tutt, "Rothiemurchus," Winchester. *July 12th*, 1952.

Dr. W. M. Scott, of Bridgwater, writes: "In my letter *re* That Slang Term—'Vet.', I suggested supplanting the writter word 'Vet.' by 'Vety', not by 'Veterinary' as it appears in print now. It reads much nicer and is less irritating to the eye."

Advertiser's Announcement

Burroughs Wellcome & Co. are pleased to announce that 'Wellcome' brand Feline Infectious Enteritis Vaccine is available to members of the veterinary profession.

The vaccine, which is prepared from the tissues of susceptible animals infected with the virus of this disease, is issued in ampoules of 1 c.c. Further details and literature will be forwarded on request to the Veterinary Sales Division, 183-193, Euston Road, London, N.W.1. Telephone: EUS 4477.

## DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN

### Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

| Period | Anthrax | Foot-and-mouth | Fowl Pest | Parasitic Mange | Sheep Scab | Swine Fever |
|---|---|---|---|---|---|---|
| 1st to 15th June, 1952 | 19 | 63 | 5 | — | — | 31 |
| Corresponding period in— | | | | | | |
| 1951 | 14 | — | 6 | — | — | 55 |
| 1950 | 14 | 1 | 8 | — | — | 5 |
| 1949 | 12 | — | 35 | — | 1 | — |
| 1st Jan. to 15th June, 1952 | 262 | 365 | 114 | — | 1 | 530 |
| Corresponding period in— | | | | | | |
| 1951 | 250 | 18 | 476 | — | 4 | 428 |
| 1950 | 199 | 14 | 81 | — | 19 | 8 |
| 1949 | 96 | 11 | 249 | — | 28 | 5 |